AMENDMENTS TO THE SPECIFICATION

Please amend the following paragraphs: [0011], [0046], [0057] and [0059]. No new matters have been introduced.

[0011] The present invention discloses a system, method and software product to numerically simulate highly compressible material such as foam with a pragmatic approach. Under the assumption of uniaxial loading and isotropic material, a method of calculating stress function f(λ) is developed as shown is FIGS. 2 and 3. The method eliminates the requirement of fitting a polynomial function; instead f(λ) is calculated using only a set of the stress-strain curve from a uniaxial loading test. Based upon the data of this stress-strain curve, the stress function f(λ) is pre-computed for a range of equally spaced stretch ratios λ. These results are stored in a computer's RAM as a lookup table and retrieved later during the solution phase of FEA. The present invention does not require time-consuming trial-and-error process of fitting polynomial coefficients. This is a huge advantage over the ~~exiting~~ existing method. The stresses corresponding to a particular strain or stretch ratio can be interpolated rapidly from the pre-computed table directly during the lengthy solution phase.

[0046] Elastic material is a material that recovers to its original shape after unloading (i.e., the load is removed).

[0057] By rearranging formulas **240**, **250**, **260** and the rest of higher order formulas, the resulting equation for stress function f(λ) is rewritten as listed in ~~320~~310. The equation ~~320~~ 310 is rewritten as a different form equation as shown in ~~330~~320. Wherein the value of stress function f(λ) for the stretch ratio of interest λ equals to the summation of a sequence of $\lambda^{(-\upsilon)^j}$ $\sigma_0\left(\lambda^{(-\upsilon)^j}\right)$, where j is an integer related to the j-th term of the sequence, ν is Poisson's ratio of the compressible material, and $\sigma_0\left(\lambda^{(-\upsilon)^j}\right)$ is the stress value at stretch ratio $\lambda^{(-\upsilon)^j}$. Using the relationship between strain ε and stretch ratio λ in ~~340~~330, the equation ~~330~~ 320 transforms to equation

~~350~~340, which can be evaluated solely with the stress values corresponding to the strains from the strain-stress curve obtained via a uniaxial tension/compression test of the material of interest. Finally, the nominal stress σ_0 and true stresses σ are rewritten and dependent only on the stress function $f(\lambda)$ listed in formulas **350** and **360**, respectively

[0059] With reference now to FIG. 5, it shows a flow chart **500** for computing the infinite series in equation ~~330~~340**.** Because the order of magnitude decreases drastically from one term to the next, the sequence converges very rapidly. According to one embodiment of the present invention, the flow chart **500** of evaluation of function $f(\lambda)$ is summarized in FIG. 5. At **510**, $f(\lambda)$ is assigned a value equals to λ multiplied by $\sigma_0(\lambda\text{-}1)$ for a given λ. The stress σ_0 value at strain ε_0 or λ-1 is from engineering test strain-stress data (e.g., the curve defined in the user input phase of FEA software). At **520**, λ is stored into a variable λ_{old}. A new variable λ_{new} is stored as λ_{old}^{-v} at **530**, where v is Poisson's ratio of the compressible material. At **540**, a comparing test is performed for the absolute value of (λ_{new} -1) being less than or equal to a threshold value ξ. In one embodiment, ξ is set to 0.01. If the test succeeds, the computation of $f(\lambda)$ has finished, the rest of the terms in the infinite series is too small to affect the final result of the computation. If the test fails, another stress value at strain λ_{new} -1 is multiplied by λ_{new} and accumulated into function $f(\lambda)$ at **550**. At **560**, the value of λ_{new} is stored into λ_{old}. The process goes back to **530** until the computation finishes.